

Phase II Targeted Brownfields Site Assessment



East Bay Habitat for Humanity, Inc.
10800 Edes Avenue Site
Oakland, California

Prepared For:



Prepared By:



1575 Treat Blvd., Suite 212
Walnut Creek, California 94598

Final Report
Phase II Investigation
January 2006

**East Bay Habitat for Humanity, Inc.
10800 Edes Avenue Site
Oakland, California
Targeted Brownfields Assessment
Phase II Investigation
Final Report**

**USACE Delivery Order Number: W912P7-05-F-0049
Document Control Number: 12767.061.003**

January 2006


**Prepared for:
United States Environmental Protection Agency
Region 9**

**Prepared by:
Weston Solutions, Inc.
1575 Treat Boulevard, Suite 212
Walnut Creek, California 94598**

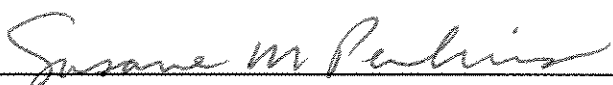
**East Bay Habitat for Humanity, Inc.
10800 Edes Avenue Site
Oakland, California
Targeted Brownfields Site Assessment
Phase II Investigation
Final Report**

**USACE Delivery Order Number: W912P7-05-F-0049
Document Control Number: 12767.061.003**

Approved by: _____


Joe De Fao, Project Manager
Weston Solutions, Inc.

Approved by: _____


Susanne Perkins, USEPA Task Monitor
United States Environmental Protection Agency, Region 9

Approved by: _____



Teresita Salire, USACE Task Monitor
United States Army Corps of Engineers

TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION	1
2.0 BACKGROUND	2
2.1 Location and Description	2
2.2 Operational History	2
2.3 Neighboring Properties	2
2.4 Previous Investigations and Regulatory Involvement	3
2.5 Geologic Information	3
3.0 SITE ASSESSMENT ACTIVITIES	7
3.1 Soil Sampling	7
3.1.1 Site Surface Soil	8
3.1.2 Site Subsurface Soil	8
3.1.2.1 Greenhouse Area	8
3.1.2.2 Boiler Room Area	8
3.1.2.3 Debris Areas	9
3.1.2.4 Suspected Fuel Tank Area	9
3.2 Groundwater Sampling	9
3.3 Quality Control Samples	10
3.4 Deviations from the Sampling and Analysis Plan	10
4.0 RESULTS	15
4.1 Soil Sampling Results	16
4.1.1 RCRA Metals and Asbestos	16
4.1.2 Polynuclear Aromatic Hydrocarbons	16
4.1.3 Organochlorine Pesticides	16
4.1.4 Petroleum Hydrocarbons	17
4.2 Groundwater Sampling Results	17
4.2.1 RCRA Metals	17
4.2.2 Polynuclear Aromatic Hydrocarbons	17
4.2.3 Organochlorine Pesticides	18
4.2.4 Petroleum Hydrocarbons	18
4.2.5 Halogenated Volatile Organic Compounds	18
5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	41
5.1 Summary and Conclusions	41
5.2 Recommendations	42

APPENDICES

- Appendix A: References
- Appendix B: Photographic Documentation
- Appendix C: Laboratory Analytical Reports

LIST OF TABLES

Table	Page
Table 3-1: Sample Location Coordinates	11
Table 4-1: Summary of Asbestos and RCRA Metals Analytical Data - Soil	19
Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil	26
Table 4-3: Summary of Organochlorine Pesticide Analytical Data - Soil	32
Table 4-4: Summary of Petroleum Hydrocarbon Analytical Data - Soil	34
Table 4-5: Summary of Groundwater Analytical Data	38

LIST OF FIGURES

Figure	Page
Figure 2-1: Site Location Map	5
Figure 2-2: Site Layout Map	6
Figure 3-1: Sample Location Map	14
Figure 4-1: Soil Sample Locations Exceeding Action Levels	40

LIST OF ACRONYMS

AOC	Analyte of Concern
BEC	Brighton Environmental Consulting
bgs	below ground surface
bog	below original grade
BTEX	Benzene, Toluene, Ethylbenzene, total Xylenes
DDD	4,4' dichlorodiphenyldichloroethylene
DDE	4,4'-dichlorodiphenyldichloroethane
DDT	4,4'-dichlorodiphenyltrichloroethane
DTSC	California Department of Toxic Substances Control
EBHH	East Bay Habitat for Humanity, Inc.
EPA	United States Environmental Protection Agency
ESL	Environmental Screening Level
FID	Flame-Ionization Detector
GPS	Global Positioning System
mg/kg	milligrams per kilogram
NESHAP	National Emission Standards for Hazardous Air Pollutants
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	tetrachloroethene
PID	Photo-Ionization Detector
PRG	Preliminary Remedial Goal
RCRA	Resource Conservation and Recovery Act
RBSL	Risk Based Screening Level
RWQCB	San Francisco Bay Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
STL	Severn Trent Laboratories, Inc.
TBSA	Targeted Brownfields Site Assessment
TCE	trichloroethene
TPH	Total Petroleum Hydrocarbons
TVA	Thermo Environmental Instruments Toxic Vapor Analyzer Model TVA1000B®
ULR	Urban Land Redevelopment
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound
WESTON	Weston Solutions, Inc.

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA), Region 9, in coordination with the United States Army Corps of Engineers (USACE), tasked Weston Solutions, Inc. (WESTON) to conduct a Targeted Brownfields Site Assessment (TBSA) Phase II Investigation at the 10800 Edes Avenue site located in Oakland, Alameda County, California. The EPA Region 9 TBSAs are intended to characterize conditions at Brownfields sites. Brownfields sites include sites being considered for planned redevelopment or reuse. This TBSA was performed for East Bay Habitat for Humanity, Inc. (EBHH) who plans to purchase the property for redevelopment as low-income, single family homes.

The objectives of the sampling effort are to determine whether soil and groundwater at the site have been impacted by analytes of concern (AOCs) from historic site uses, at concentrations greater than set action levels. Historic use of the site was documented in the September 2005 Phase I Environmental Site Assessment report prepared by Brighton Environmental Consulting (BEC).

This report summarizes the field activities conducted by WESTON on November 9 to 11, 2005 and presents the results from the sampling event. Any use of this document or information contained herein by persons or entities other than the EPA Region 9 shall be at the sole risk and liability of said persons or entity. WESTON, therefore, expressly disclaims any liability to persons other than the EPA Region 9 who may use or rely upon this report in any way or for any purpose.

2.0 BACKGROUND

2.1 Location and Description

The site is located at 10800 Edes Avenue, Oakland, California (Latitude 37° 43' 52" North, Longitude 112° 10' 34" West) in a light industrial and residential area (Figure 2-1). The site occupies approximately 1.8 acres, with 0.1 acres beneath Edes Avenue, and is rectangular in shape. The approximate dimensions of the site are 228 feet by 325 feet. The site is bordered by an industrial park to the northwest, Southern Pacific Railroad to the northeast, and an undeveloped property owned by EBHH to the southeast at 10900 Edes Avenue. The southwest property boundary runs along the centerline of Edes Avenue; residential housing is located across the road. The site is currently undeveloped, and debris, ranging from general trash to concrete and bricks, is distributed throughout the site. San Leandro Creek is located approximately 0.25 mile south of the site, and the San Francisco Bay is located approximately 2 miles to the southwest. The site layout is presented in Figure 2-2.

2.2 Operational History

From the early 1920s to 1965, the site was used as a plant nursery. Former operations at the site utilized seven greenhouses, two boiler rooms, and a suspected fuel tank. Other former site structures included a caretaker's house and garage. The nursery was known to grow roses for part of the site's history.

The property is currently owned by Evans Brothers Construction, who have operated a construction and demolition business at the site since 1982. The site was mostly used for the cleaning and recycling of bricks. Crushed bricks and asphalt grindings were used to stabilize the central and northern portions of the site. The site has recently been subjected to dumping of garbage and debris.

2.3 Neighboring Properties

The adjacent property located at 10900 Edes Avenue was recently purchased by EBHH. This property also operated as a nursery and gardening outlet with eight greenhouses from at least 1926 to 1952. Between 1952 and 2000, the property was used as a truck dismantling and salvage yard. Due to past operations, soil at the site was contaminated with lead, polynuclear aromatic hydrocarbons (PAHs), and Polychlorinated Biphenyls (PCBs) at concentrations above EPA Preliminary Remediation Goals (PRGs). An underground storage tank was removed from the southwest portion of the property. EBHH remediated the property with a loan from the State of California and a Brownfields Cleanup Grant from the EPA. The California Department of Toxic Substances Control (DTSC) issued a "no further action" letter for the property in September 2005. The property located at 750 107th Avenue is reported to have been occupied by Hard Chrome Engineering, a chrome plating shop. The former plating shop facility is located approximately 475

feet northeast of the site and is presumed to be upgradient of the site. The DTSC reports that the former chrome plating operation was a source of chromium detected in groundwater beneath the plating shop. In addition to metals, plating shops often use other chemicals, including halogenated solvents, in plating operations.

The adjacent property located northwest of the site is reported to be a former foundry and is currently used for light industrial warehouses. Figure 2-2 shows the undeveloped portion of this property being used for the storage of automobiles.

2.4 Previous Investigations and Regulatory Involvement

A Phase I Environmental Site Assessment has been conducted at the site by BEC for EBHH. No other known investigations have been conducted at the site.

2.5 Geologic and Hydrogeologic Information

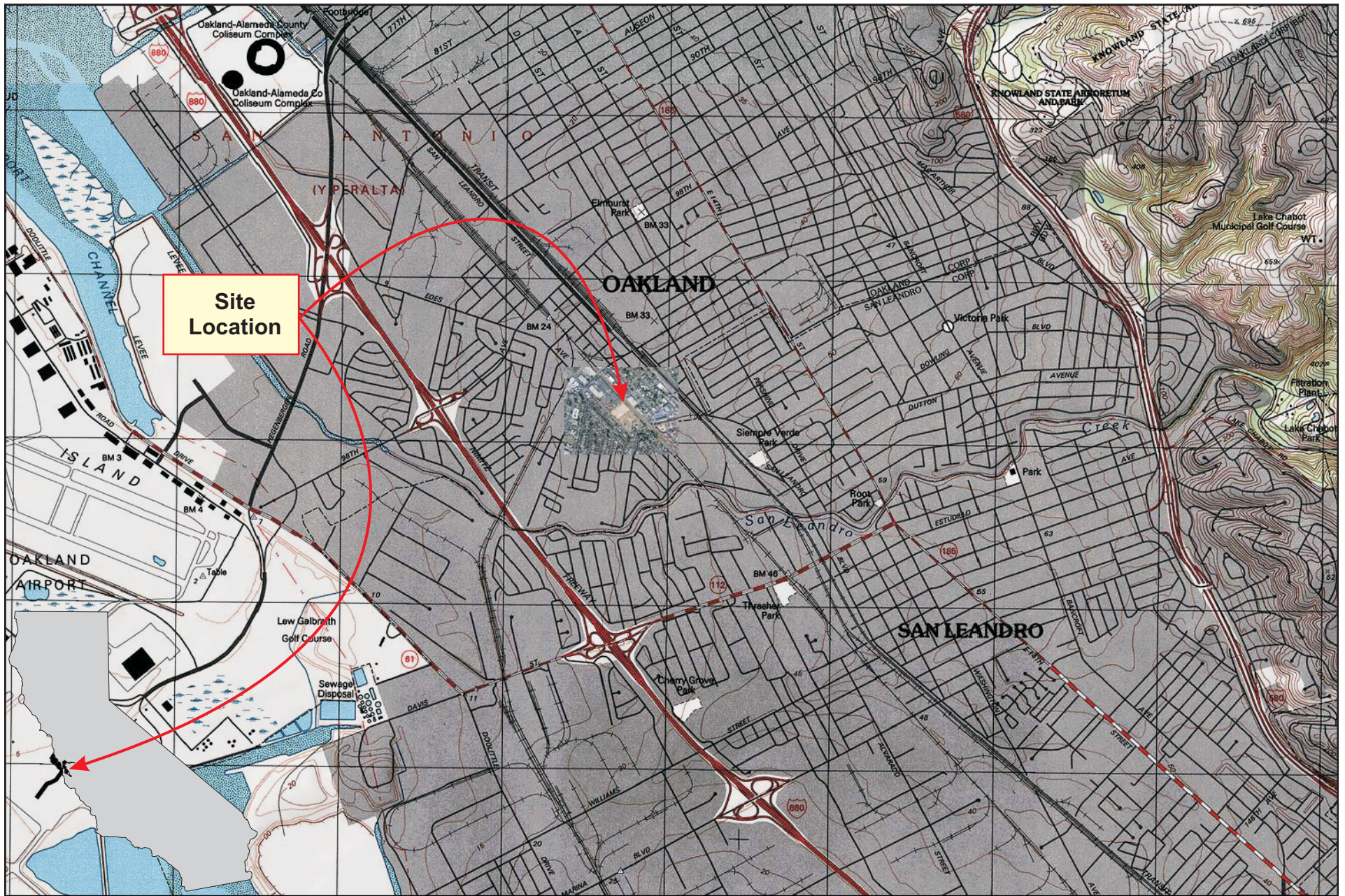
The site lies within the San Leandro Subarea of the East Bay Plain Groundwater Basin. The East Bay Plain Groundwater Basin is bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, and on the south by Niles Cone Groundwater Basin. The East Bay Plain Groundwater Basin extends beneath the San Francisco Bay to the west.

Water bearing units in the East Bay Plain Groundwater Basin consist of unconsolidated sediments of Quaternary age. Deposits include the early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, the early Holocene Temescal Formation, and artificial fill. The cumulative thickness of the unconsolidated sediments is about 1,000 feet. The Santa Clara Formation consists of alluvial fan deposits inter-fingered with lake, swamp, river channel, and flood plain deposits. The Santa Clara Formation ranges from 300 to 600 feet thick. The Alameda Formation includes a sequence of alluvial fan deposits bounded by mud deposits on the top and bottom. The Alameda Formation was deposited primarily in an estuarine environment, and ranges from 26 to 245 feet thick. The Temescal Formation is an alluvial deposit consisting primarily of silts and clays with some gravel layers. The Temescal Formation ranges from 1 to 50 feet thick. Artificial fill is found mostly along the San Francisco Bay front and wetland areas and is derived primarily from dredging as well as quarrying, construction, demolition debris, and municipal waste. The fill ranges from 1 to 50 feet with the thickest deposits found nearer to San Francisco Bay.

Historic water levels in the deep (more than 500 feet) aquifer in the East Bay Plain Groundwater basin have varied between 10 and 40 feet below ground surface (bgs) since the early 1950s. The low water level was reached in around 1962. Shallower aquifers have a much less pronounced water level decline. The historical low water level for aquifers at a depth of approximately 250 feet bgs has been approximately 30 feet bgs since 1950. Water levels rose about 5 feet per year between

1965 and 1980, and have been rising continuously since then, but at a less rapid rate. As of 2000, water levels are very near ground surface in all aquifers.

During this subsurface investigation, groundwater was encountered at depths ranging from 24 to 34 feet bgs. The shallow groundwater is confined; static groundwater levels ranged from approximately 17 to 21 feet bgs. Based on the topography of the area, groundwater flow is likely to be towards the southwest, towards San Francisco Bay.

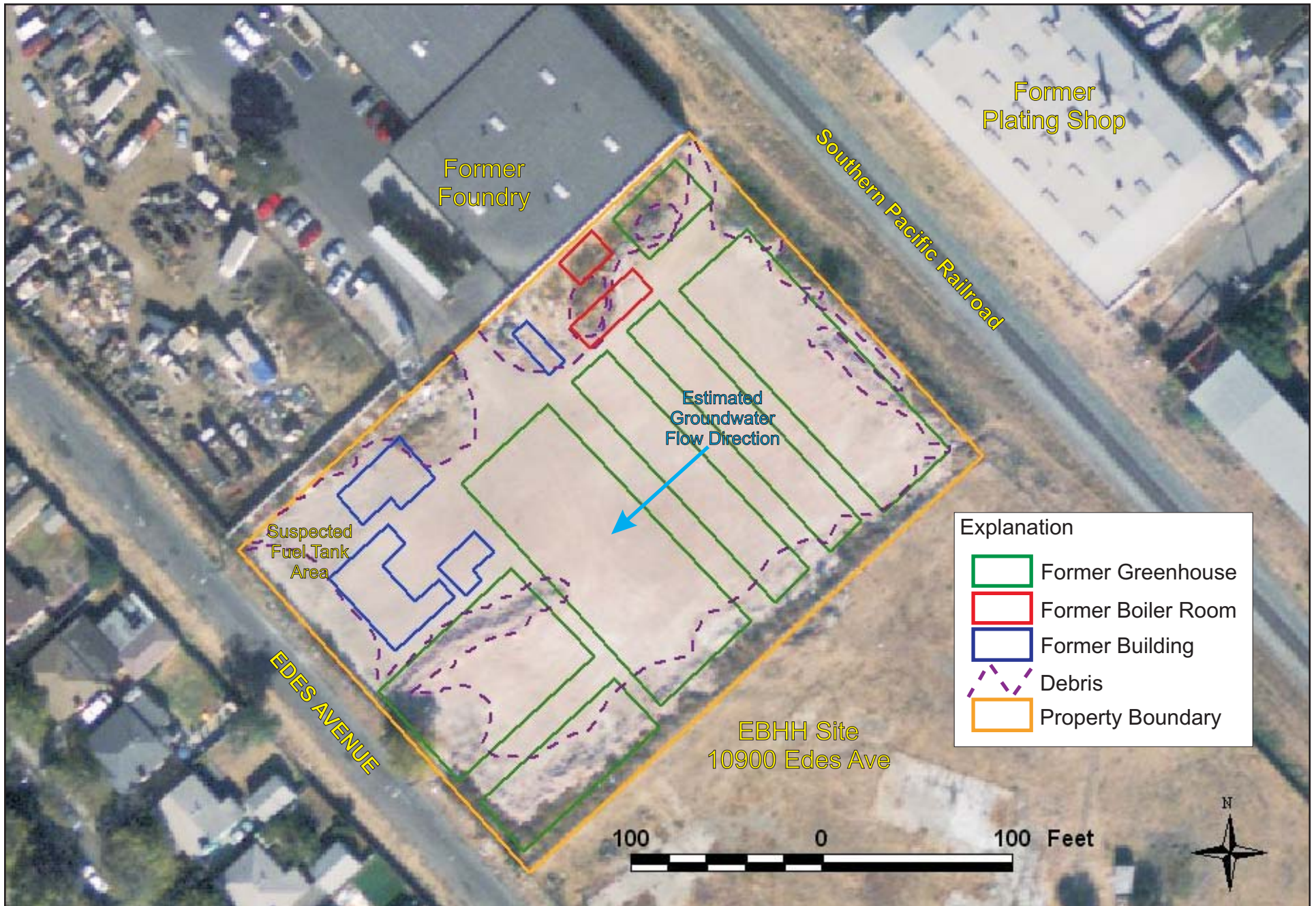


TN MN
15°

0 1000 FEET 0 500 1000 METERS
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)



Site Location Map
10800 Edes Avenue
Oakland, California



3.0 SITE ASSESSMENT ACTIVITIES

On November 9 to 11, 2005, WESTON collected soil samples from 50 boring locations and groundwater from four boring locations to evaluate surface and subsurface conditions at the site. Sampling was conducted in accordance with the EBHH 10800 Edes Avenue Sampling and Analysis Plan (SAP) (WESTON, November 2005). An outline of sampling activities is presented below. A more detailed account of sampling procedures and locations is found in the SAP, and deviations to the SAP are described in Section 3.3 of this TBSA.

3.1 Soil Sampling

Prior to drilling, a permit (Water Resources Well Permit Number W2005-1100) was issued by the Alameda County Public Works Agency, and Underground Service Alert notification ticket number 0425247 was issued to identify utilities entering the site.

To determine whether site soils have been impacted from historic use of hazardous substances, WESTON collected surface soil samples and subsurface soil samples from 50 locations. A grid sampling approach was used to determine the sample locations using Battelle Memorial Institute's *Visual Sampling Plan* version 3.0 software, hot spot sampling goals program. Soil samples were collected using dedicated plastic trowels and placed into labeled glass jars for metal analysis. Soil samples collected for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, ethylbenzene and total xylenes (BTEX) analyses were collected in 5 gram En Core® Sampler containers.

The majority of the site has recently been covered with up to 3 feet of crushed brick fill; areas along the northwest, southwest, and southeast property boundary appear to be original grade. Subsurface soil samples were collected with a truck mounted Geoprobe® direct push drill rig operated by Precision Sampling, Inc. of Richmond, California.

Surface samples were collected from 0 to 6 inches bgs. Sample numbers were designated with the suffix "A" to identify the samples as surface soil. Subsurface soil samples were collected from below original grade (bog), beneath the crushed brick fill. None of the subsurface soil samples were collected from the crushed brick fill. Subsurface samples from borings located in areas of crushed brick fill were collected from the following intervals:

- 0 to 1 feet bog (sample numbers identified with the suffix "B"),
- 1 to 2 feet bog (sample numbers identified with the suffix "C"), and
- 2.5 to 3.5 feet bog (sample numbers identified with the suffix "D")

Subsurface samples from borings located in areas where there was no crushed brick fill (original grade) were collected from the following intervals:

- 0.5 to 1.5 feet bgs (sample numbers identified with the suffix “B”),
- 1.5 to 2.5 feet bgs (sample numbers identified with the suffix “C”), and
- 3.0 to 4.0 feet bgs (sample numbers identified with the suffix “D”)

WESTON surveyed the sampling locations using a Trimble ProXR Global Positioning System (GPS) device. The surveyed geographic coordinates for the samples are presented in Table 3-1. The sampling locations are shown in Figure 3-1.

3.1.1 Site Surficial Soil

Surface soil samples EEBH-1A through EBHH-29A, and EBHH-31A, -33A, -35A, -37A, -39A, -41A, -43A, -49A, and -50A were analyzed for Resource Conservation and Recovery Act (RCRA) metals and asbestos to assess potential impacts from previous activities by the nursery, Evans Brothers Construction, and former debris piles. A total of 19 surface soil samples collected from former debris areas were additionally analyzed for TPH as diesel, TPH as motor oil and PAHs.

3.1.2 Site Subsurface Soil

3.1.2.1 Greenhouse Area

As shown in Figure 3-1, WESTON collected subsurface soil samples from 28 boring locations (EEBH-1 through EEBH-28) spaced on a 40 foot grid in the area of seven former greenhouses to assess potential impacts from former nursery operations. Subsurface soil samples EEBH-1B through EEBH-28B and EEBH-1C through EEBH-28C were analyzed for RCRA metals. Samples collected from every other boring location were analyzed for organochlorine pesticides. Subsurface soil samples EEBH-1D through EBHH-28D were placed on hold pending analytical results of the shallower samples.

3.1.2.2 Boiler Room Area

WESTON collected soil samples from eight boring locations (EBHH-29 through EEBH-36) spaced on a 20 foot grid in the area of former boiler rooms. Twenty-four subsurface soil samples were screened with a Thermo Environmental Instruments Toxic Vapor Analyzer Model TVA-1000B[®] (TVA) flame ionization detector (FID) and photo ionization detector (PID) in the field. Four subsurface soil samples exhibiting the greatest concentration of organic vapors as measured with the TVA were submitted for TPH as diesel, TPH as motor oil, and PAH analyses.

3.1.2.3 Debris Areas

As shown in Figure 3-1, WESTON collected subsurface soil samples from 19 borings located in areas of former debris piles. Three subsurface soil samples from each boring were screened for organic vapors with a TVA. One subsurface soil sample exhibiting the greatest concentration of organic vapors as measured with the TVA was submitted to the laboratory for each boring location.

Additionally, 12 subsurface soil samples were collected from four borings (EBHH-38, EBHH-40, EBHH-42, and EBHH-44) located in the northwestern former debris area and screened for organic vapors with a TVA. Four subsurface soil samples, exhibiting the greatest concentration of organic vapors as measured with the TVA, were submitted to the laboratory for analysis.

A total of 23 subsurface soil samples from former debris areas were submitted for TPH as diesel, TPH as motor oil, and PAH analyses.

3.1.2.4 Suspected Fuel Tank Area

WESTON collected samples from six boring locations (EBHH-45 through EEBH-50) spaced on a 20 foot grid in the area of a suspected fuel tank. Subsurface soil samples collected from the borings were screened for organic vapors with a TVA. Four soil samples exhibiting the greatest concentration of organic vapors as measured with the TVA were submitted for TPH as diesel, TPH as motor oil, TPH as gasoline, and BTEX analyses.

3.2 Groundwater Sampling

To evaluate whether groundwater at the site has been impacted by the historic use of hazardous substances on site and from the upgradient plating shop, WESTON collected groundwater samples from the following locations:

- Groundwater sample EBHH-GW-1, collected downgradient of the former plating shop, was analyzed for halogenated volatile organic compounds (VOCs) and RCRA metals.
- Groundwater sample EBHH-GW-2, collected downgradient of the boiler room area, was analyzed for TPH as diesel, TPH as motor oil, and PAHs.
- Groundwater sample EBHH-GW-3, collected down gradient of the suspected fuel tank, was analyzed for TPH as diesel, TPH as motor oil, TPH as gasoline, and BTEX.
- Groundwater sample EBHH-GW-4, collected downgradient of the former greenhouses, was analyzed for TPH as diesel, TPH as motor oil, TPH as gasoline, BTEX, RCRA metals, halogenated VOCs, PAHs, and organochlorine pesticides.

Groundwater samples were collected from temporary well screens with a peristaltic pump and disposable high density polyethylene tubing. The temporary well screens were installed with the Geoprobe® using 2-inch drive rods fitted with an expendable drive point. The rods and drive point were drilled into groundwater, 0.75-inch polyvinyl chloride screen and casing were inserted into the drive rods, and the drive rods were removed, leaving the well screen in place.

Groundwater was first encountered in the borings at depths ranging from approximately 24 to 34 feet bgs; groundwater levels rose to 17 to 21 feet bgs in the temporary well screens. Groundwater samples collected for RCRA metals analysis were filtered in the field with a 0.45 micron filter. Groundwater sampling locations are shown in Figure 3-1.

3.3 Quality Control Samples

WESTON collected four equipment blank samples from the sampling equipment. One equipment blank sample was collected from the soil sampler for each day of use and was labeled EBHH-EB-1, EBHH-EB-2, and EBHH-EB-3. EBHH-EB-4 was collected from the expendable drive tip holder used to install the temporary well screens.

3.4 Deviations from the Sampling and Analysis Plan

The following deviation from the listed sections of the EBHH SAP dated November 2005 occurred during field activities:

- **SAP Section 4.1 Sampling Locations and Rationale, and SAP Section 6.2.1 Soil Sampling**

Soil borings were drilled deeper than 4 feet as prescribed in the SAP to accommodate the variable depths of crushed brick fill present at the site. Actual boring depths were drilled 4 feet below the crushed brick fill as clarified in Section 3.1 of this report.

- **SAP Section 5.0 Analytical Methods**

Samples were analyzed for TPH as gasoline by EPA Method 8015B and BTEX by EPA Method 8021B instead of EPA Method 8260B as specified in the SAP.

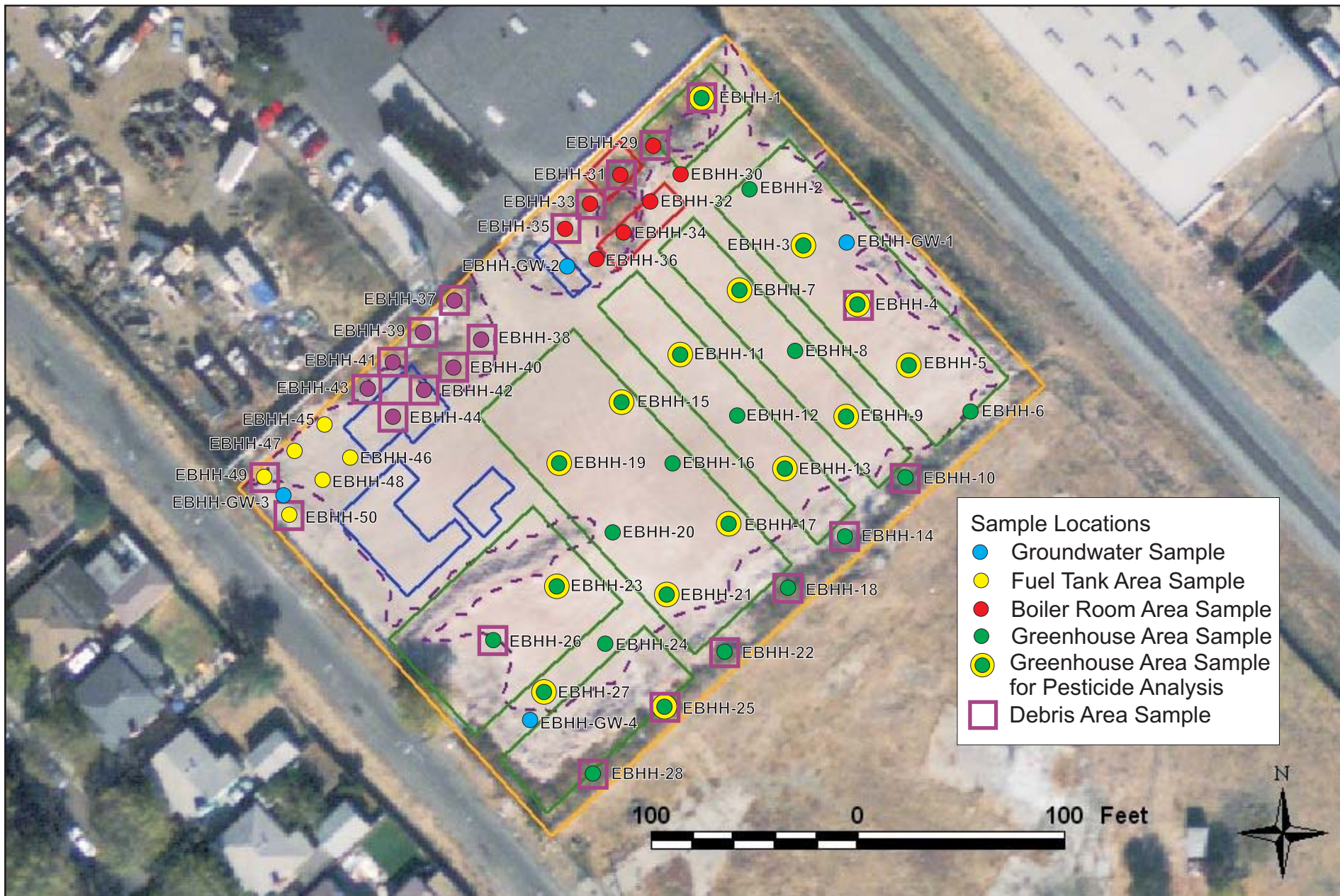
- **SAP Section 9.1.2 Assessment of Sample Variability (Field Duplicate Samples)**

The SAP specified that duplicate samples would be collected for 10 percent of the field samples. Duplicate samples submitted for TPH as diesel and TPH as motor oil analysis were collected for 6.1 percent of the field samples. Duplicate samples submitted for PAH analysis were collected for 4.3 percent of the field samples. All other duplicate samples submitted to the laboratory were at least 10 percent of the field samples.

Table 3-1: Sample Location Coordinates East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields Oakland, California		
Comment	Longitude	Latitude
EBHH-1	-122.175818271	37.732409117
EBHH-2	-122.175737903	37.732284831
EBHH-3	-122.175647443	37.732209938
EBHH-4	-122.175558581	37.732131639
EBHH-5	-122.175472216	37.732047637
EBHH-6	-122.175369997	37.731985753
EBHH-7	-122.175756492	37.732149824
EBHH-8	-122.175664976	37.732068807
EBHH-9	-122.175577625	37.731982190
EBHH-10	-122.175480237	37.731899676
EBHH-11	-122.175857309	37.732068106
EBHH-12	-122.175760643	37.731984543
EBHH-13	-122.175670616	37.731901106
EBHH-14	-122.175583536	37.731821606
EBHH-15	-122.175959522	37.732002779
EBHH-16	-122.175874298	37.731918729
EBHH-17	-122.175778631	37.731838530
EBHH-18	-122.175679759	37.731754042
EBHH-19	-122.176063245	37.731923815
EBHH-20	-122.175973794	37.731830148
EBHH-21	-122.175883593	37.731744501
EBHH-22	-122.175788658	37.731667839
EBHH-23	-122.176067607	37.731758464
EBHH-24	-122.175985827	37.731680695

Table 3-1: Sample Location Coordinates East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields Oakland, California		
Comment	Longitude	Latitude
EBHH-25	-122.175888844	37.731595319
EBHH-26	-122.176174896	37.731686666
EBHH-27	-122.176090497	37.731608317
EBHH-28	-122.176008260	37.731507575
EBHH-29	-122.175897514	37.732345035
EBHH-30	-122.175852735	37.732307617
EBHH-31	-122.175955369	37.732307586
EBHH-32	-122.175903240	37.732271622
EBHH-33	-122.176006458	37.732269618
EBHH-34	-122.175949974	37.732230235
EBHH-35	-122.176049684	37.732236789
EBHH-36	-122.175996995	37.732195208
EBHH-37	-122.176239413	37.732143198
EBHH-38	-122.176191150	37.732089657
EBHH-39	-122.176292866	37.732100059
EBHH-40	-122.176238485	37.732052986
EBHH-41	-122.176342942	37.732060477
EBHH-42	-122.176290291	37.732023152
EBHH-43	-122.176385057	37.732026130
EBHH-44	-122.176342219	37.731986823
EBHH-45	-122.176455776	37.731977704
EBHH-46	-122.176413328	37.731933380
EBHH-47	-122.176506472	37.731941341
EBHH-48	-122.176461511	37.731903069

Table 3-1: Sample Location Coordinates East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields Oakland, California		
Comment	Longitude	Latitude
EBHH-49	-122.176559758	37.731909637
EBHH-50	-122.176517208	37.731859072
EBHH-GW1	-122.175576346	37.732214184
EBHH-GW2	-122.176045167	37.732185687
EBHH-GW3	-122.176526592	37.731883841
EBHH-GW4	-122.176114925	37.731577106
Locations reported in decimal degrees using WGS 1984 datum Sample locations surveyed with Trimble ProXR Global Positioning System device Data was post processed using differential correction to a local base data provider		



Sample Location Map
10800 Edes Avenue
Oakland, California

Figure
3-1

4.0 RESULTS

Soil and groundwater samples were collected and submitted to Severn Trent Laboratories, Inc. (STL) of Pleasanton, California. Soil samples were analyzed by STL for RCRA metals, organochlorine pesticides, TPH as diesel, TPH as motor oil, TPH as gasoline, BTEX, and/or PAHs. Surface soil samples were also analyzed by STL's subcontractor, Forensics Analytical of Hayward, California, for asbestos. Groundwater samples were analyzed for RCRA metals, organochlorine pesticides, TPH as diesel, TPH as motor oil, TPH as gasoline, BTEX, halogenated VOCs, and/or PAHs. All data generated from the laboratories was deemed to be of acceptable quality with qualification.

Laboratory analytical data for the AOCs were compared to following action levels for soil selected by the project scoping team:

- 1) Oakland Urban Land Redevelopment (ULR) Program's Tier-1 risk-based screening levels (RBSLs) (January 2001) for residential surficial soil
- 2) EPA Region 9 PRGs for residential soil (October 2004)
- 3) San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for residential land use for shallow soil where groundwater is not a potential source of drinking water
- 4) National Emission Standards for Hazardous Air Pollutants (NESHAP) for asbestos
- 5) Background concentrations for RCRA metals as referenced by Oakland ULR Program

Laboratory analytical data for the AOCs were also compared to the following action levels:

- 1) Oakland ULR Program's Tier-1 RBSLs for inhalation of indoor vapors exposure pathway for residential land use
- 2) RWQCB ESLs for residential land use for shallow soil where groundwater is not a potential source of drinking water

Detected analytes that were not listed as AOCs in the SAP were compared to applicable benchmarks from the above sources. All of the benchmarks used to establish these action levels are risk-based screening tools. Chemical concentrations above these levels do not automatically indicate that a response action is necessary. Likewise, chemical concentrations below these levels may require future action upon the development of more appropriate site-specific action levels. A summary and discussion of the significant results is presented below. Complete copies of the laboratory analytical data are included in Appendix C.

4.1 Soil Sampling Results

4.1.1 RCRA Metals and Asbestos

RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and asbestos results for soil samples are presented in Table 4-1. A total of 107 soil samples, including 13 duplicate samples, were analyzed for RCRA metals. Five soil samples exceed the lead EPA PRG of 400 milligrams per kilogram (mg/kg). A maximum lead concentration of 700 mg/kg was detected in sample (EBHH-6B) collected from 3 to 4 feet bgs. All of the soil samples exceed the arsenic RBSL of 0.32 mg/kg; however, 48 of the 107 samples only exceed the local background arsenic concentration of 5.9 mg/kg as published by the City of Oakland ULR Program for soil at the Roberts Landing Development Site in San Leandro, California (approximately 4 miles south of the 10800 Edes Avenue site). Typical background arsenic concentrations in California range from 1 to 50 mg/kg. One surface soil sample (EBHH-25A) contained arsenic at 104 mg/kg, elevated above typical background concentrations. Figure 4-1 shows the locations of soil samples exceeding the action level for lead and arsenic. No other RCRA metals detected in the soil samples exceed action levels.

A total of 42 surface soil samples, including four duplicate samples, were analyzed for asbestos. None of the samples contained asbestos above the reporting limit of 1 percent.

4.1.2 Polynuclear Aromatic Hydrocarbons

Table 4-2 contains a summary of PAHs results for soil samples. A total of 48 soil samples, including two duplicate samples, were analyzed for PAHs. All 16 listed PAHs were detected in soil samples collected from the site. Benzo[a]pyrene exceeded the RBSL of 25 micrograms per kilogram ($\mu\text{g/kg}$) in 21 of the 48 soil samples and the PRG of 62 $\mu\text{g/kg}$ in 20 of the 48 samples. The greatest concentrations of PAHs were detected in the surface soil sample EBHH-25A, which exceeded action levels for six PAHs: 1,600 $\mu\text{g/kg}$ benzo[a]anthracene; 1,600 $\mu\text{g/kg}$ benzo[a]pyrene; 2,700 $\mu\text{g/kg}$ benzo[b]fluoranthene; 920 $\mu\text{g/kg}$ benzo[k]fluoranthene; 1,500 $\mu\text{g/kg}$ indeno[1,2,3-cd]pyrene; and 320 $\mu\text{g/kg}$ dibenz[a,h]anthracene. Benzo[a]pyrene was the most prevalent PAH detected at the site and is considered be one of the most potent carcinogens of the PAH family. Figure 4-1 shows the locations of soil samples exceeding the action level for benzo[a]pyrene.

4.1.3 Organochlorine Pesticides

Table 4-3 contains a summary of pesticide results for soil samples. A total of 34 soil samples, including five duplicate samples, were analyzed for organochlorine pesticides. Pesticides were detected in 21 of 35 soil samples at concentrations one order of magnitude below the action level. The pesticides detected in the samples are chlordane (technical), alpha-chlordane, gamma-chlordane,

4,4'-dichlorodiphenyltrichloroethane (DDT), 4,4'-dichlorodiphenyldichloroethylene (DDD), and 4,4'-dichlorodiphenyldichloroethane (DDE). Maximum concentrations of detected pesticides were: 220 µg/kg chlordane (technical), 110 µg/kg alpha-chlordane, and 85 µg/kg gamma chlordane in soil sample EBHH-1B, 200 µg/kg DDT, and 360 µg/kg DDE in soil sample EBHH-27B, and 55 µg/kg DDD in soil sample EBHH-23C.

4.1.4 Petroleum Hydrocarbons

Table 4-4 contains a summary of TPH and BTEX results for soil samples. A total of 52 soil samples, including three duplicate samples, were analyzed for TPH. Three samples exceeded the TPH as diesel RWQCB ESL of 100 mg/kg and three samples exceeded the TPH as motor oil RWQCB ESL of 500 mg/kg. The greatest TPH concentrations were detected in the surface soil sample EBHH-25A, containing 190 mg/kg TPH as diesel and 520 mg/kg TPH as motor oil. TPH as gasoline and BTEX were not detected in any of the soil samples.

4.2 Groundwater Sampling Results

Five groundwater samples, including one duplicate sample, were submitted to the laboratory for RCRA metals, organochlorine pesticides, TPH as diesel, TPH as motor oil, TPH as gasoline, BTEX, halogenated VOCs, and/or PAHs analyses. Table 4-5 contains a summary of groundwater sample results for all targeted analytes.

4.2.1 RCRA Metals

RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) analysis was conducted on groundwater samples collected from borings EBHH-GW-1 and EBHH-GW-4. Only barium was detected in the groundwater samples at concentrations ranging from 89 to 150 micrograms per liter (µg/L), two orders of magnitude below the RWQCB ESL of 1,000 µg/L. No other RCRA metals were detected in the groundwater samples.

4.2.2 Polynuclear Aromatic Hydrocarbons

PAHs analysis was conducted on groundwater samples collected from borings EBHH-GW-2 and EBHH-GW-3. Only 0.18 µg/L of phenanthrene was detected in the groundwater sample collected from EBHH-GW-4, one order of magnitude below the RWQCB ESL of 4.6 µg/L. No other PAHs were detected in the groundwater samples.

4.2.3 Organochlorine Pesticides

Pesticide analysis was conducted on the groundwater sample collected from boring EBHH-GW-4. No organochlorine pesticides were detected in the groundwater sample.

4.2.4 Total Petroleum Hydrocarbons

Groundwater samples collected from borings EBHH-GW-2, EBHH-GW-3, and EBHH-GW-4 were analyzed for TPH as diesel and TPH as motor oil. Groundwater samples collected from borings EBHH-GW-3 and EBHH-GW-4 were also analyzed for TPH as gasoline and BTEX. None of the groundwater samples contained detectable concentrations of these analytes.

4.2.5 Halogenated Volatile Organic Compounds

Groundwater samples collected from borings EBHH-GW-1 and EBHH-GW-4 were analyzed for halogenated VOCs. The groundwater sample collected from EBHH-GW-1 contained 1.5 µg/L trichloroethene (TCE), 0.87 µg/L tetrachloroethene (PCE), and 1.0 µg/L chloromethane; all are several orders of magnitude below the RBSL and RWQCB ESL for these constituents. No other halogenated VOCs were detected in the groundwater samples.

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-1A	0 - 0.5	Greenhouse/debris	<1% ⁶	14⁷	100 J ⁸	1.9	38	38	0.0043 J	<2.2	<1.1
EBHH-1B	3 - 4	Greenhouse/debris	na ⁹	4.6	97 J	1.3	35	70	0.0013 J	<2.2	<1.1
EBHH-1C	4 - 5	Greenhouse/debris	na	4.6	150 J	1.5	36	8.3	<0.0011R ¹⁰	<2.3	<1.1
EBHH-2A	0 - 0.5	Greenhouse	<1%	6.7	320 J	1.2	22	130	0.0047 J	<2.2	<1.1
EBHH-2B	3 - 4	Greenhouse	na	5.3	180 J	1.8	41	48	0.0018 J	<2.3	<1.2
EBHH-2C	4 - 5	Greenhouse	na	5.8	150 J	1.6	40	18	0.0013 J	<2.3	<1.2
EBHH-3A	0 - 0.5	Greenhouse	<1%	5.4	230 J	0.88	18	100	0.0041 J	<2.2	<1.1
EEBH-51A	0 - 0.5	Duplicate EBHH-3A	<1%	4.5	300	0.98	17	100	0.18	<2.3	<1.2
EBHH-3B	3 - 4	Greenhouse	na	6.6	120 J	2.3	33	110	0.0028 J	<2.0	1.9
EEBH-51B	3 - 4	Duplicate EBHH-3B	na	9.1	100	4.8	37	87	0.11	<2.2	4.5
EBHH-3C	4 - 5	Greenhouse	na	5.7	160 J	1.8	37	13	<0.0012 R	<2.3	<1.1
EEBH-51C	4 - 5	Duplicate EBHH-3C	na	4.6	130	1.3	30	14	<0.058	<2.3	<1.2
EBHH-4A	0 - 0.5	Greenhouse/debris	<1%	8.7	190 J	1.0	21	120	0.0038 J	<2.2	<1.1
EBHH-4B	3 - 4	Greenhouse/debris	na	5.5	190 J	1.9	39	170	0.0020 J	<2.3	<1.1
EBHH-4C	4 - 5	Greenhouse/debris	na	7.2	170 J	2.0	38	30	0.0019 J	<2.20	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-5A	0 - 0.5	Greenhouse	<1%	5.4	140 J	1.9	22	130	0.0027 J	<2.2	<1.1
EBHH-5B	3 - 4	Greenhouse	na	4.8	170 J	1.7	33	130	0.0014 J	<2.3	<1.1
EBHH-5C	4 - 5	Greenhouse	na	5.8	180 J	1.6	39	7.4	<0.0012 J	<2.4	<1.2
EBHH-6A	0 - 0.5	Greenhouse	<1%	5.2	150 J	1.5	37	9.2	0.0032 J	<2.3	<1.1
EBHH-6B	3 - 4	Greenhouse	na	8.9	530 J	2.8	43	700	0.0034 J	<2.2	<1.1
EBHH-6C	4 - 5	Greenhouse	na	5.8	150 J	2.2	29	78	0.0012 J	<2.2	<1.1
EBHH-7A	0 - 0.5	Greenhouse	<1%	5.6	240 J	0.79	20	110 J	0.28	<2.2	<1.1
EBHH-7B	3 - 4	Greenhouse	na	6.0	190 J	1.6	40	49 J	<0.058	<2.4	<1.2
EBHH-7C	4 - 5	Greenhouse	na	4.9	180 J	1.2	31	5.9 J	<0.058	<2.3	<1.2
EBHH-8A	0 - 0.5	Greenhouse	<1%	5.5	140 J	0.76	20	88 J	0.26	<2.2	<1.1
EBHH-8B	3 - 4	Greenhouse	na	7.3	190 J	1.8	42	75 J	0.075	<2.4	<1.2
EBHH-8C	4 - 5	Greenhouse	na	5.3	140 J	1.2	30	5.8 J	<0.055	<2.2	<1.1
EBHH-9A	0 - 0.5	Greenhouse	<1%	12	120 J	1.3	17	320 J	0.083	<2.1	<1.1
EBHH-9B	3 - 4	Greenhouse	na	6.5	160 J	2.2	38	230 J	0.14	<2.2	<1.1
EBHH-9C	4 - 5	Greenhouse	na	6.4	170 J	1.5	39	33 J	0.071	<2.3	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-10A	0 - 0.5	Greenhouse/debris	<1%	6.6	140 J	2.6	35	120 J	0.14	<2.0	<1.0
EBHH-10B	0.5 - 1.5	Greenhouse/debris	na	7.5	180 J	1.8	29	130 J	0.18	<2.2	<1.1
EBHH-10C	1.5 - 2.5	Greenhouse/debris	na	4.3	120 J	1.2	28	7.7 J	<0.055	<2.2	<1.1
EBHH-11A	0 - 0.5	Greenhouse	<1%	7.0	220 J	0.80	19	100 J	0.11	<2.1	<1.1
EBHH-11B	3 - 4	Greenhouse	na	7.0	170 J	1.7	34	190 J	0.11	<2.1	<1.1
EBHH-11C	4 - 5	Greenhouse	na	5.6	180 J	1.4	37	11 J	<0.054	<2.2	<1.1
EBHH-12A	0 - 0.5	Greenhouse	<1%	5.7	150 J	0.92	18	77 J	0.10	<2.1	<1.1
EBHH-12B	3 - 4	Greenhouse	na	6.0	150 J	1.5	39	14 J	0.061	<2.3	<1.1
EBHH-12C	4 - 5	Greenhouse	na	5.3	160 J	1.4	32	7.1 J	<0.055	<2.2	<1.1
EBHH-13A	0 - 0.5	Greenhouse	<1%	20	130	1.8	27	590	0.19	<2.3	<1.1
EEBH-52A	0 - 0.5	Duplicate EEBH-13A	<1%	13	130	1.5	23	420	0.13	<2.1	<1.1
EBHH-13B	3 - 4	Greenhouse	na	5.1	130	2.2	39	77	0.12	<2.1	<1.0
EEBH-52B	3 - 4	Duplicate EEBH-13B	na	5.4	130	2.4	30	71	0.11	<2.1	<1.1
EBHH-13C	4 - 5	Greenhouse	na	5.6	120	1.1	32	6.2	<0.054	<2.1	<1.1
EEBH-52C	4 - 5	Duplicate EEBH-13C	na	5.5	120	1.1	31	6.7	<0.055	<2.1	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-14A	0 - 0.5	Greenhouse/debris	<1%	5.2	140	2.0	29	110	0.11	<1.9	<0.97
EBHH-14B	0.5 - 1.5	Greenhouse/debris	na	5.2	130	1.2	30	69	0.084	<2.1	<1.1
EBHH-14C	1.5 - 2.5	Greenhouse/debris	na	4.3	110	1.1	32	18	<0.053	<2.1	<1.1
EBHH-15A	0 - 0.5	Greenhouse	<1%	9.2	220	1.4	31	170	0.19	<2.5	<1.3
EBHH-15B	1.5 - 2.5	Greenhouse	na	3.9	110	1.2	29	7.3	<0.056	<2.2	<1.1
EBHH-15C	2.5 - 3.5	Greenhouse	na	4.3	180	1.2	36	6.8	<0.055	<2.2	<1.1
EBHH-16A	0 - 0.5	Greenhouse	<1%	5.3	140	1.1	20	55	0.30	<2.2	<1.1
EBHH-16B	1.5 - 2.5	Greenhouse	na	5.3	170	1.2	32	15	0.066	<2.1	<1.1
EBHH-16C	2.5 - 3.5	Greenhouse	na	4.5	120	1.0	29	5.5	<0.055	<2.2	<1.1
EBHH-17A	0 - 0.5	Greenhouse	<1%	7.8	190	0.99	22	170	0.15	<2.1	<1.1
EBHH-17B	1.5 - 2.5	Greenhouse	na	5.3	140	1.2	31	17	0.15	<2.2	<1.1
EBHH-17C	2.5 - 3.5	Greenhouse	na	4.7	99	1.0	29	13	0.055	<2.1	<1.1
EBHH-18A	0 - 0.5	Greenhouse/debris	<1%	9.0	180	2.2	39	150	0.25	2.3	<1.1
EBHH-18B	0.5 - 1.5	Greenhouse/debris	na	4.7	130	1.2	33	12	0.057	<2.2	<1.1
EBHH-18C	1.5 - 2.5	Greenhouse/debris	na	7.0	170	1.6	37	55	0.098	<2.2	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-19A	0 - 0.5	Greenhouse	<1%	5.3	140	0.99	23	86	0.12	<2.1	<1.1
EBHH-19B	1.5 - 2.5	Greenhouse	na	5.0	170	1.6	38	110	0.15	<2.3	<1.1
EBHH-19C	2.5 - 3.5	Greenhouse	na	3.8	130	1.1	31	4.9	<0.056	<2.2	<1.1
EBHH-20A	0 - 0.5	Greenhouse	<1%	5.7	180	0.90	26	120 J	0.23	<2.2	<1.1
EBHH-20B	1.5 - 2.5	Greenhouse	na	6.7	170	1.9	56	57 J	0.13	<2.3	<1.1
EBHH-20C	2.5 - 3.5	Greenhouse	na	4.9	96	0.97	29	4.5 J	<0.052	<2.1	<1.1
EBHH-21A	0 - 0.5	Greenhouse	<1%	9.4	180	0.98	27	240 J	0.098	<2.1	<1.1
EBHH-21B	1.5 - 2.5	Greenhouse	na	6.1	170 J	1.6	37	27	0.0035 J	<2.2	<1.1
EBHH-21C	2.5 - 3.5	Greenhouse	na	5.0	120	1.2	33	6.0 J	<0.055	<2.1	<1.1
EBHH-22A	0 - 0.5	Greenhouse/debris	<1%	11	240	3.7	46	260 J	0.30	<2.3	<1.1
EBHH-22B	0.5 - 1.5	Greenhouse/debris	na	7.3	200	1.9	41	61 J	0.076	<2.2	<1.1
EBHH-22C	1.5 - 2.5	Greenhouse/debris	na	4.8	120	1.1	31	7.1 J	0.088	<2.1	<1.0
EBHH-23A	0 - 0.5	Greenhouse	<1%	6.4	260	0.85	23	350 J	0.43	<2.0	<1.0
EEBH-53A	0 - 0.5	Duplicate EEBH-23A	<1%	6.8	300	0.92	25	410	0.41	<2.0	<1.0
EBHH-23B	1.5 - 2.5	Greenhouse	na	11	170	1.8	47	140 J	0.086	<2.3	<1.1
EEBH-53B	1.5 - 2.5	Duplicate EEBH-23B	na	12	140	1.6	35	120	0.11	<2.2	<1.1
EBHH-23C	2.5 - 3.5	Greenhouse	na	6.5	130	1.3	36	6.8 J	<0.057	<2.3	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-24A	0 - 0.5	Greenhouse	<1%	14	170	1.9	44	64 J	0.14	<2.1	<1.0
EBHH-24B	1.5 - 2.5	Greenhouse	na	15	210	2.0	47	110 J	0.13	<2.3	<1.2
EBHH-24C	2.5 - 3.5	Greenhouse	na	16	190	1.8	47	70 J	0.079	<2.4	<1.2
EBHH-25A	0 - 0.5	Greenhouse/debris	<1%	104	190	2.1	36	190	0.13	<2.2	<1.1
EBHH-25B	0.5 - 1.5	Greenhouse/debris	na	7.7	170	1.7	43	100	0.13	<2.2	<1.1
EBHH-25C	1.5 - 2.5	Greenhouse/debris	na	5.0	140	1.3	36	7.4	<0.057	<2.3	<1.1
EBHH-26A	0 - 0.5	Greenhouse/debris	<1%	7.5	130	1.1	29	160 J	0.16	<2.2	<1.1
EBHH-26B	1.5 - 2.5	Greenhouse/debris	na	6.7	190	1.9	45	180 J	0.097	<2.2	<1.1
EBHH-26C	2.5 - 3.5	Greenhouse/debris	na	7.7	170	1.5	42	11 J	<0.057	<2.3	<1.1
EBHH-27A	0 - 0.5	Greenhouse	<1%	5.6	150	1.1	22	100	0.19	<2.2	<1.1
EEBH-54A	0 - 0.5	Duplicate EEBH-27A	<1%	5.6	190	1.1	25	240	0.13	<2.1	<1.1
EBHH-27B	1.5 - 2.5	Greenhouse	na	9.7	180	2.3	50	150	0.11	<2.2	<1.1
EEBH-54B	1.5 - 2.5	Duplicate EEBH-27B	na	8.4	190	2.3	48	160	0.13	<2.2	<1.1
EBHH-27C	2.5 - 3.5	Greenhouse	na	8.1	140	1.5	43	8.9	<0.057	<2.2	<1.1
EBHH-28A	0 - 0.5	Greenhouse/debris	<1%	5.6	210	1.7	36	390	0.10	<2.2	<1.1
EBHH-28B	0.5 - 1.5	Greenhouse/debris	na	6.7	190	1.8	47	9.0	<0.057	<2.3	<1.2
EBHH-28C	1.5 - 2.5	Greenhouse/debris	na	4.6	120	1.2	33	5.6	<0.055	<2.2	<1.1

Table 4-1: Summary of Asbestos and RCRA¹ Metals Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	Asbestos	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Action Levels	PRGs²		1%³	0.39/0.062	5,400	37	210	400/150	23	390	390
	RBSLs⁴		none	0.32	5,200	37	74,000	none	4.7	370	370
	Background⁵		none	1.8 - 5.9	none	<1.3	24.8 - 43	3.3 - 10.4	<0.10	<2.5	<2.5
EBHH-29A	0 - 0.5	Boiler room/debris	<1%	9.0	110	1.6	27	56	0.26	<2.1	<1.0
EBHH-31A	0 - 0.5	Boiler room/debris	<1%	14	120	1.7	28	74	0.27	<2.2	<1.1
EBHH-33A	0 - 0.5	Boiler room/debris	<1%	11	120	1.7	33	63	0.23	<2.1	<1.1
EEBH-55A	0 - 0.5	Duplicate EEBH-33A	na	10	120	2.0	28	70	0.37	<2.1	<1.1
EBHH-35A	0 - 0.5	Boiler room/debris	<1%	12	140	1.9	26	460	0.65	<2.1	<1.0
EBHH-37A	0 - 0.5	Debris	<1%	4.4	130	3.3	120	38	<0.051	<2.1	<1.0
EBHH-39A	0 - 0.5	Debris	<1%	9.8	160	4.2	92	91	0.078	<2.1	<1.0
EBHH-41A	0 - 0.5	Debris	<1%	7.0	130	4.3	95	70	0.092	<2.2	<1.1
EBHH-43A	0 - 0.5	Debris	<1%	5.6	120	2.0	51	82	0.17	<2.1	<1.1
EEBH-56A	0 - 0.5	Duplicate EEBH-43A	na	5.3	150	1.8	68	89	1.8	<2.1	<1.1
EBHH-49A	0 - 0.5	Fuel tank/debris	<1%	7.2	160 J	1.9 J	26	50 J	0.24 J	<2.1 J	<1.1
EBHH-50A	0 - 0.5	Fuel tank/debris	<1%	7.8	170 J	1.6 J	41	100 J	0.16 J	<2.2 J	<1.1
EBHH-57A	0 - 0.5	Duplicate EBHH-50A	na	7.0	150 J	1.6 J	43	110 J	0.13 J	<2.0 J	<1.0
¹ RCRA = Resource Conservation and Recovery Act ² PRGs = United States Environmental Protection Agency - Region 9 Preliminary Remediation Goals for residential soil (October 2004) [Federal PRG/California modified PRG] ³ National Emissions Standards for Hazardous Air Pollutants (NESHAP) used for Asbestos Action Level ⁴ RBSLs = City of Oakland Urban Land Redevelopment Program Tier 1 Risk Based Screening Levels - residential surficial soil (January 2001) ⁵ Background data from City of Oakland Urban Land Redevelopment Program - Roberts Landing Development Site in San Leandro, CA						⁶ <(#) = Analyte concentration is below stated reporting limit ⁷ Bold = Analytical result exceeds action level or background level ⁸ J = Estimated quantity ⁹ na = not analyzed ¹⁰ R = Rejected quantity Asbestos analysis by EPA Method 600/R-93-116 Polarized Light Microscopy, RCRA Metals analysis by EPA Method 6010B, mercury analysis by EPA Method 7471A					

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-1A	0 - 0.5	Greenhouse/debris	<55 ³	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55	<55
EBHH-1B	3 - 4	Greenhouse/debris	<54	<54	<54	<54	<54	<54	<54	55	<54	<54	<54	<54	<54	<54	67	<54
EBHH-4A	0 - 0.5	Greenhouse/debris	<55	<55	<55	<55	<55	<55	71	67	72⁴	73	<55	<55	<55	91	87	<55
EBHH-4C	4 - 5	Greenhouse/debris	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	7.4	<5.7	<5.7	9.2	<5.7	6.0	<5.7	6.1	8.0	<5.7
EBHH-10A	0 - 0.5	Greenhouse/debris	<57	<57	<57	<57	<57	<57	67	100	88	130	<57	97	100	160	150	<57
EBHH-10D	3 - 4	Greenhouse/debris	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7
EBHH-14A	0 - 0.5	Greenhouse/debris	<25	<25	31	<25	110	35	150	240	270	380	140	280	250	220	260	67
EBHH-14B	0.5 - 1.5	Greenhouse/debris	<5.4	<5.4	7.0	<5.4	41	<5.4	16	41	27	52	21	31	29	57	59	5.4

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-18A	0 - 0.5	Greenhouse/debris	<57	<57	<57	<57	93	<57	62	85	82	120	<57	94	120	130	130	<57
EBHH-18B	0.5 - 1.5	Greenhouse/debris	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7
EBHH-22A	0 - 0.5	Greenhouse/debris	<56	<56	<56	<56	<56	<56	<56	<56	<56	74	<56	<56	<56	<56	66	<56
EBHH-22C	1.5 - 2.5	Greenhouse/debris	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EBHH-25A	0 - 0.5	Greenhouse/debris	<140	220	<140	360	7,600	860	1,600	2,200	1,600	2,700	920	990	1,500	7,100	4,900	320
EBHH-25B	0.5 - 1.5	Greenhouse/debris	<5.5	<5.5	24	<5.5	43	16	65	94	76	120	40	54	47	150	130	14
EBHH-26A	0 - 0.5	Greenhouse/debris	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270	<270
EBHH-26C	2.5- 3.5	Greenhouse/debris	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-28A	0 - 0.5	Greenhouse/debris	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
EBHH-28D	3 - 4	Greenhouse/debris	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EBHH-29A	0 - 0.5	Boiler room/debris	<27	<27	<27	<27	68	<27	77	84	110	120	40	92	150	120	140	<27
EBHH-29B	3 - 4	Boiler room/debris	8.0	<5.0	32	8.7	190	18	120	160	170	210	75	130	200	250	260	35
EBHH-30C	4 - 5	Boiler room	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
EBHH-30D	5.5 - 6.5	Boiler room	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
EBHH-31A	0 - 0.5	Boiler room/debris	<250	<250	<250	<250	290	<250	250	<250	<250	<250	<250	<250	310	330	350	<250
EBHH-31D	5.5 - 6.5	Boiler room/debris	<5.0	<5.0	<5.0	<5.0	5.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.4	6.1	<5.0
EBHH-33A	0 - 0.5	Boiler room/debris	<25	<25	<25	<25	84	29	89	110	99	110	52	100	70	140	160	33

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-55A	0 - 0.5	Duplicate EEBH-33A	<53	<53	<53	<53	93	<53	100	90	110	130	<53	64	81	140	170	<53
EBHH-33C	4 - 5	Boiler room/debris	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EBHH-34D	5.5 - 6.5	Boiler room/debris	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EBHH-35A	0 - 0.5	Boiler room/debris	<25	33	68	<25	250	87	330	350	450	470	170	270	430	460	530	180
EBHH-35C	4 - 5	Boiler room/debris	<25	<25	<25	<25	100	29	110	120	83	130	47	70	110	210	190	50
EBHH-36C	4 - 5	Boiler room	<5.0	<5.0	8.2	<5.0	31	5.6	20	26	21	29	9.8	21	22	50	46	<5.0
EBHH-37A	0 - 0.5	Debris	<27	<27	<27	<27	35	<27	34	58	79	80	<27	92	46	57	71	<27
EBHH-37B	0.5 - 1.5	Debris	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	7.2	9.2	<5.2	9.0	<5.2	<5.2	<5.2	<5.2
EBHH-38B	1.5 - 1.5	Debris	<29	<29	<29	<29	53	<29	<29	47	31	59	<29	41	40	68	81	<29
EBHH-39A	0 - 0.5	Debris	<27	<27	<27	<27	66	<27	98	150	150	240	72	140	190	130	150	72

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-39B	0.5 - 1.5	Debris	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
EBHH-40C	2.5 - 2.5	Debris	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8
EBHH-41A	0 - 0.5	Debris	<54	<54	<54	<54	440	100	380	430	360	420	160	200	300	500	690	<54
EBHH-41B	0.5 - 1.5	Debris	<5.2	<5.2	<5.2	<5.2	42	6.2	45	50	55	77	30	55	72	70	60	19
EBHH-42D	4 - 5	Debris	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9
EBHH-43A	0 - 0.5	Debris	<54	<54	<54	<54	540	130	380	400	300	350	130	190	270	470	660	77
EBHH-56A	0 - 0.5	Duplicate EEBH-43A	<270	<270	<270	<270	1,100	<270	780	790	690	700	<270	420	420	980	1,500	<270
EBHH-43B	0.5 - 1.5	Debris	<5.2	6.8	<5.2	6.4	66	13	77	77	110	140	46	98	140	100	110	20
EBHH-44B	0.5 - 1.5	Debris	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54	<54
EBHH-49A	0 - 0.5	Fuel tank/ debris	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
EBHH-49C	1.5 - 2.5	Fuel tank/ debris	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8

Table 4-2: Summary of Polynuclear Aromatic Hydrocarbons Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Naphthalene	Acenaphthene	Acenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a,h)anthracene
Action Levels	PRGs¹		1.7^{E+3}	3.7^{E+6}	none	2.7^{E+6}	none	2.2^{E+7}	620	6.2^{E+4}	62	620	6.2^{E+3}	none	620	2.3^{E+6}	2.3^{E+6}	62
	RBSLs²		2.0^{E+6}	3.1^{E+6}	3.1^{E+6}	2.1^{E+6}	1.6^{E+7}	1.6^{E+7}	250	2.5^{E+3}	25	250	250	2.1^{E+5}	250	2.1^{E+6}	1.6^{E+6}	74
EBHH-50A	0 - 0.5	Fuel tank/debris	<280	<280	<280	<280	<280	<280	<280	320	<280	380	<280	<280	<280	<280	<280	<280
EBHH-50C	1.5 - 2.5	Fuel tank/debris	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8

¹ PRGs = United States Environmental Protection Agency - Region 9 Preliminary Remediation Goals for residential soil (October 2004)

² RBSLs = City of Oakland Urban Land Redevelopment Program Tier 1 Risk Based Screening Levels - residential surficial soil (January 2001)

³ <(#) = Analyte concentration is below stated reporting limit

⁴ **Bold** = Analytical result exceeds action level

Polynuclear Aromatic Hydrocarbons analysis by EPA Method 8270C (Selective Ion Monitoring)

Figure 4-3: Summary of Organochlorine Pesticide Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/kilogram)

Sample Number	Depth (feet)	Location	Chlordane (technical)	4,4'-DDT ¹	4,4'-DDE ²	4,4'-DDD ³	alpha- Chlordane	gamma- Chlordane
Action Level	PRG ⁴		1,600	1,700	1,700	2,400	none	none
EBHH-1B	3 - 4	Greenhouse/debris	220	110	330	<11	110	85
EBHH-1C	4 - 5	Greenhouse/debris	<560 ⁵	<11	<11	<11	<11	<11
EBHH-3B	3 - 4	Greenhouse	<540	<22	<22	<22	<22	<22
EBHH-51B	3 - 4	Duplicate EBHH-3B	<550	<22	<22	<22	<22	<22
EBHH-3C	4 - 5	Greenhouse	<59	11	14	<2.4	<2.4	<2.4
EBHH-51C	4 - 5	Duplicate EBHH-3C	<58	9.8	10	<2.3	<2.3	<2.3
EBHH-4C	4 - 5	Greenhouse/debris	<57	3.0	9.8	<2.3	<2.3	<2.3
EBHH-5B	3 - 4	Greenhouse	<280	<11	16	<11	<11	<11
EBHH-5C	4 - 5	Greenhouse	<120	<2.4	<2.4	<2.4	<2.4	<2.4
EBHH-7B	3 - 4	Greenhouse	<590	93	190	35	40	26
EBHH-7C	4 - 5	Greenhouse	<120	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-9B	3 - 4	Greenhouse	<280	<11	30	<11	<11	<11
EBHH-9C	4 - 5	Greenhouse	??	83	120	<23	33	36
EBHH-11B	3 - 4	Greenhouse	<56	<2.2	4.8	<2.2	<2.2	<2.2
EBHH-11C	4 - 5	Greenhouse	<110	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-13B	3 - 4	Greenhouse	<540	21	49	<11	<11	<11
EBHH-52B	3 - 4	Duplicate EBHH-13B	<540	36	83	<22	<22	<22
EBHH-13C	4 - 5	Greenhouse	<55	<2.2	7.7	<2.2	<2.2	<2.2
EBHH-52C	4 - 5	Duplicate EBHH-13C	<55	<2.2	7.9	<2.2	<2.2	<2.2

Figure 4-3: Summary of Organochlorine Pesticide Analytical Data - Soil East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields Oakland, California (Reported in micrograms/kilogram)								
Sample Number	Depth (feet)	Location	Chlordane (technical)	4,4'-DDT ¹	4,4'-DDE ²	4,4'-DDD ³	alpha- Chlordane	gamma- Chlordane
Action Level	PRG ⁴		1,600	1,700	1,700	2,400	none	none
EBHH-15B	1.5 - 2.5	Greenhouse	<57	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-15C	2.5 - 3.5	Greenhouse	<57	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-17B	1.5 - 2.5	Greenhouse	<270	17	58	<11	<11	<11
EBHH-17C	2.5 - 3.5	Greenhouse	<270	<11	<11	<11	<11	<11
EBHH-19B	1.5 - 2.5	Greenhouse	<290	19	120	46	<11	<11
EBHH-19C	2.5 - 3.5	Greenhouse	<56	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-21B	1.5 - 2.5	Greenhouse	<280	55	260	<11	<11	<11
EBHH-21C	2.5 - 3.5	Greenhouse	<54	<2.2	2.6	<2.2	<2.2	<2.2
EBHH-23B	1.5 - 2.5	Greenhouse	<560	63	190	<22	23	<22
EBHH-53B	1.5 - 2.5	Duplicate EBHH-23B	<560	57	180	<22	<22	<22
EBHH-23C	2.5 - 3.5	Greenhouse	<560	140	98	55	<22	<22
EBHH-25B	0.5 - 1.5	Greenhouse/debris	<56	<2.2	<2.2	<2.2	<2.2	<2.2
EBHH-25C	1.5 - 2.5	Greenhouse/debris	<57	<2.3	<2.3	<2.3	<2.3	<2.3
EBHH-27B	1.5 - 2.5	Greenhouse	<550	200	360	<22	<22	<22
EBHH-27C	2.5 - 3.5	Greenhouse	<280	<11	<11	<11	<11	<11
¹ DDT = 4,4'-dichlorodiphenyltrichloroethane ² DDE = 4,4'-dichlorodiphenyldichloroethane ³ DDD = 4,4' dichlorodiphenyldichloroethylene ⁴ PRGs = United States Environmental Protection Agency - Region 9 Preliminary Remediation Goals for residential soil (October 2004) ⁵ <(#) = Analyte concentration is below stated reporting limit Organochlorine Pesticides analysis by EPA Method 8081A								

Table 4-4: Summary of Petroleum Hydrocarbon Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	TPH ¹ -diesel	TPH-motor oil	TPH-gasoline	Benzene	Toluene	Ethyl benzene	total Xylenes
Action Levels	ESLs ²		100	500	100	none	none	none	none
	RBSLs ³		none	none	none	2.7	9000	5100	54000
	PRGs ⁴		none	none	none	0.64	520	400	270
EBHH-1A	0 - 0.5	Greenhouse/debris	16	110	na ⁵	na	na	na	na
EBHH-1B	3 - 4	Greenhouse/debris	27	150	na	na	na	na	na
EBHH-4A	0 - 0.5	Greenhouse/debris	91	420	na	na	na	na	na
EBHH-4C	4 - 5	Greenhouse/debris	<1.1 ⁶	<57	na	na	na	na	na
EBHH-10A	0 - 0.5	Greenhouse/debris	24	130	na	na	na	na	na
EBHH-10D	3 - 4	Greenhouse/debris	<1.1	<57	na	na	na	na	na
EBHH-14A	0 - 0.5	Greenhouse/debris	20	110	na	na	na	na	na
EBHH-14B	0.5 - 1.5	Greenhouse/debris	18	84	na	na	na	na	na
EBHH-18A	0 - 0.5	Greenhouse/debris	25	180	na	na	na	na	na
EBHH-18D	3 - 4	Greenhouse/debris	<1.1	<57	na	na	na	na	na
EBHH-22A	0 - 0.5	Greenhouse/debris	35	200	na	na	na	na	na
EBHH-22C	1.5 - 2.5	Greenhouse/debris	<1.1	<53	na	na	na	na	na
EBHH-25A	0 - 0.5	Greenhouse/debris	190 ⁷	520	na	na	na	na	na
EBHH-25B	0.5 - 1.5	Greenhouse/debris	2.8	<56	na	na	na	na	na

Table 4-4: Summary of Petroleum Hydrocarbon Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	TPH ¹ -diesel	TPH-motor oil	TPH-gasoline	Benzene	Toluene	Ethyl benzene	total Xylenes
Action Levels	ESLs ²		100	500	100	none	none	none	none
	RBSLs ³		none	none	none	2.7	9000	5100	54000
	PRGs ⁴		none	none	none	0.64	520	400	270
EBHH-26A	0 - 0.5	Greenhouse/debris	25	170	na	na	na	na	na
EBHH-26C	2.5 - 3.5	Greenhouse/debris	1.3	<57	na	na	na	na	na
EBHH-28A	0 - 0.5	Greenhouse/debris	70	410	na	na	na	na	na
EBHH-28D	3 - 4	Greenhouse/debris	2.6	<53	na	na	na	na	na
EBHH-29A	0 - 0.5	Boiler room/debris	17	140	na	na	na	na	na
EBHH-29B	3 - 4	Boiler room/debris	38	230	na	na	na	na	na
EBHH-30C	4 - 5	Boiler room	41	220	na	na	na	na	na
EBHH-30D	5.5 - 6.5	Boiler room	41	200	na	na	na	na	na
EBHH-31A	0 - 0.5	Boiler room/debris	33	220	na	na	na	na	na
EBHH-31D	5.5 - 6.5	Boiler room/debris	3.3	<58	na	na	na	na	na
EBHH-33A	0 - 0.5	Boiler room/debris	30	190	na	na	na	na	na
EBHH-55A	0 - 0.5	Duplicate EBHH-33A	53	320	na	na	na	na	na
EBHH-33C	4 - 5	Boiler room/debris	2.9	<55	na	na	na	na	na
EBHH-34D	5.5 - 6.5	Boiler room	5.9	<57	na	na	na	na	na
EBHH-35A	0 - 0.5	Boiler room/debris	93	480	na	na	na	na	na

Table 4-4: Summary of Petroleum Hydrocarbon Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	TPH ¹ -diesel	TPH-motor oil	TPH-gasoline	Benzene	Toluene	Ethyl benzene	total Xylenes
Action Levels	ESLs ²		100	500	100	none	none	none	none
	RBSLs ³		none	none	none	2.7	9000	5100	54000
	PRGs ⁴		none	none	none	0.64	520	400	270
EBHH-35C	4 - 5	Boiler room/debris	40	290	na	na	na	na	na
EBHH-36C	4 - 5	Boiler room	16	70	na	na	na	na	na
EBHH-37A	0 - 0.5	Debris	120	440	na	na	na	na	na
EBHH-37B	0.5 - 1.5	Debris	5.9	<52	na	na	na	na	na
EBHH-38B	1.5 - 2.5	Debris	23	120	na	na	na	na	na
EBHH-39A	0 - 0.5	Debris	65	320	na	na	na	na	na
EBHH-39B	0.5 - 1.5	Debris	4.1	<52	na	na	na	na	na
EBHH-40C	2.5 - 3.5	Debris	1.2	<58	na	na	na	na	na
EBHH-41A	0 - 0.5	Debris	50	270	na	na	na	na	na
EBHH-41B	0.5 - 1.5	Debris	41	100	na	na	na	na	na
EBHH-42D	4 - 5	Debris	1.2	<59	na	na	na	na	na
EBHH-43A	0 - 0.5	Debris	42	210	na	na	na	na	na
EBHH-56A	0 - 0.5	Duplicate EBHH-43A	74	370	na	na	na	na	na
EBHH-43B	0.5 - 1.5	Debris	6.6	<52	na	na	na	na	na
EBHH-44B	0.5 - 1.5	Debris	59	360	na	na	na	na	na

Table 4-4: Summary of Petroleum Hydrocarbon Analytical Data - Soil
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in milligrams/kilogram)

Sample Number	Depth (feet)	Location	TPH ¹ -diesel	TPH-motor oil	TPH-gasoline	Benzene	Toluene	Ethyl benzene	total Xylenes
Action Levels	ESLs ²		100	500	100	none	none	none	none
	RBSLs ³		none	none	none	2.7	9000	5100	54000
	PRGs ⁴		none	none	none	0.64	520	400	270
EBHH-45B	0.5 - 1.5	Fuel tank/debris	4.3	<58	<0.59	<0.0029	<0.0029	<0.0029	<0.0059
EBHH-45D	3 - 4	Fuel tank/debris	<1.2	<58	<0.58	<0.0029	<0.0029	<0.0029	<0.0058
EBHH-48B	0.5 - 1.5	Fuel tank/debris	1.7	<58	<0.59	<0.0029	<0.0029	<0.0029	<0.0059
EBHH-49A	0 - 0.5	Fuel tank/debris	71	700	<940	<0.0047	<0.0047	<0.0047	<0.0094
EBHH-49C	1.5 - 2.5	Fuel tank/debris	<1.2	<58	<0.94	<0.0047	<0.0047	<0.0047	<0.0094
EBHH-58C	1.5 - 2.5	Duplicate of EBHH-49C	1.8	<56	<0.92	<0.0046	<0.0046	<0.0046	<0.0092
EBHH-50A	0 - 0.5	Fuel tank/debris	100	800	na	na	na	na	na
EBHH-50C	1.5 - 2.5	Fuel tank/debris	<1.1	<57	na	na	na	na	na

¹ TPH = Total Petroleum Hydrocarbons

² ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels - potential discharge into marine or estuary surface water system (February 2005)

³ RBSLs = City of Oakland Urban Land Redevelopment Program Tier 1 Risk Based Screening Levels - residential inhalation of indoor vapors (January 2001)

⁴ PRGs = United States Environmental Protection Agency - Region 9 Preliminary Remediation Goals for residential soil (October 2004)

⁵ na = not analyzed

⁶ <(#) = Analyte concentration is below stated reporting limit

⁷ **Bold** = Analytical result exceeds action level

TPH-diesel, TPH-motor oil, and TPH-gasoline analysis by EPA Method 8015B Modified

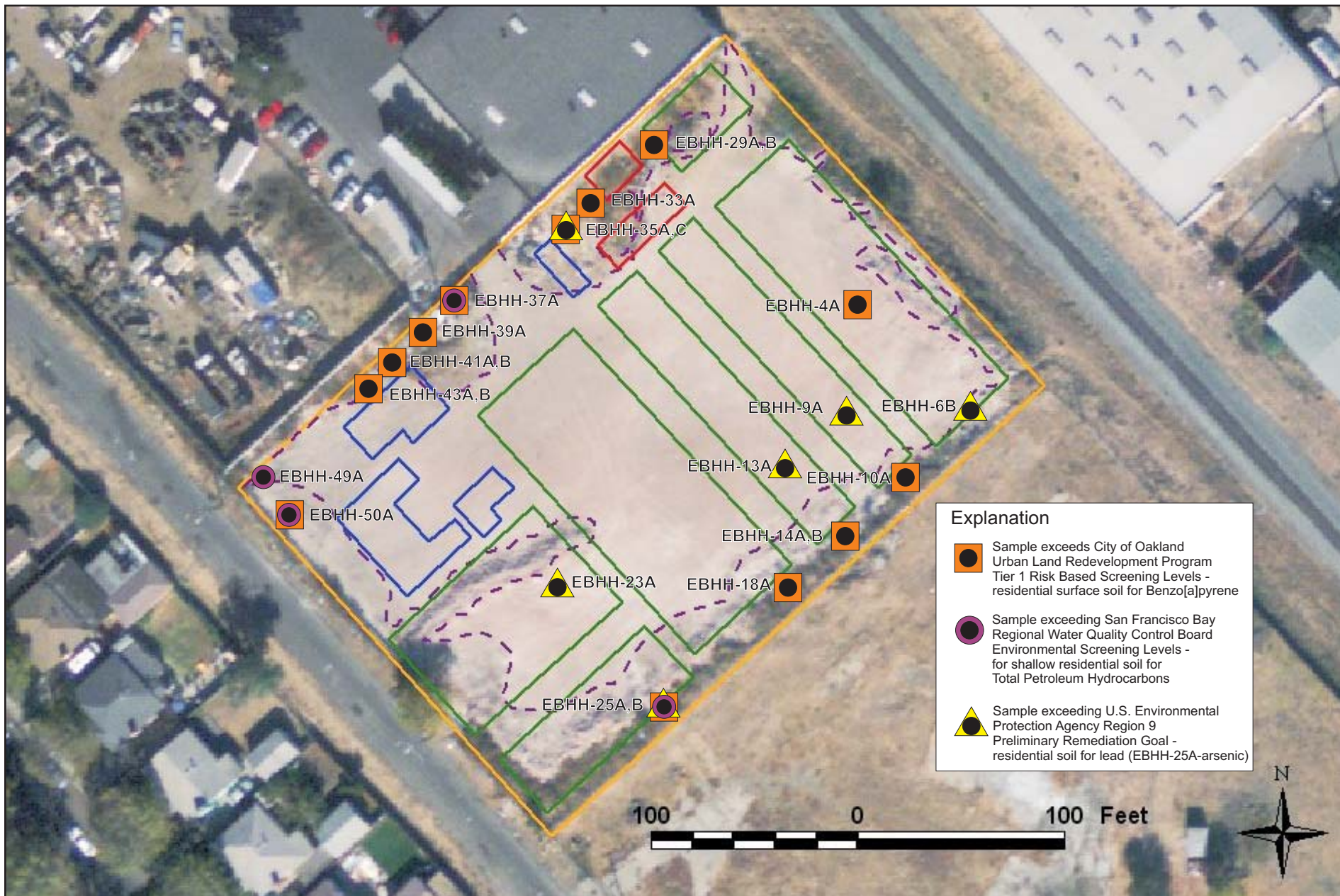
Benzene, Toluene, Ethyl benzene, and total Xylenes analyses by EPA Method 8021

Table 4-5: Summary of Groundwater Analytical Data
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/Liter)

Analyte	Action Level		EBHH-GW1	EBHH-GW2	EBHH-GW3	EBHH-GW4	EBHH-GW5
	RBSLs ¹	ESLs ²	downgradient from plating shop	downgradient from boiler rooms	downgradient from fuel tanks	downgradient from site	duplicate of EBHH-GW4
RCRA ³ Metals							
Arsenic	none	36	<5.0 ⁴	na ⁵	na	<5.0	<5.0
Barium	none	1000	89	na	na	140	150
Cadmium	none	1.1	<2.0	na	na	<2.0	<2.0
Total Chromium	none	180	<5.0	na	na	<5.0	<5.0
Lead	none	2.5	<5.0	na	na	<5.0	<5.0
Mercury	260	0.012	<0.02	na	na	<0.02	<0.02
Selenium	none	5	<5.0	na	na	<5.0	<5.0
Silver	none	0.19	<5.0	na	na	<5.0	<5.0
Petroleum Hydrocarbons							
TPH ⁶ -gasoline	none	500	na	na	<50	<50	<50
TPH-diesel	none	640	na	<50	<50	<50	<50
TPH-motor oil	none	640	na	<500	<500	<500	<500
Benzene	110	46	na	na	<0.5	<0.5	<0.5
Toluene	210,000	130	na	na	<0.5	<0.5	<0.5
Ethyl benzene	>SOL ⁷	290	na	na	<0.5	<0.5	<0.5
total Xylenes	>SOL	100	na	na	<0.5	<0.5	<0.5

Table 4-5: Summary of Groundwater Analytical Data
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California
(Reported in micrograms/Liter)

Analyte	Action Level		EBHH-GW1	EBHH-GW2	EBHH-GW3	EBHH-GW4	EBHH-GW5
	RBSLs ¹	ESLs ²	downgradient from plating shop	downgradient from boiler rooms	downgradient from fuel tanks	downgradient from site	duplicate of EBHH-GW4
Organochlorine Pesticides							
4-4' DDT ⁸	none	0.004	na	na	na	<0.069	<0.097
4-4' DDE ⁹	none	0.001	na	na	na	<0.069	<0.097
4-4' DDD ¹⁰	none	0.001	na	na	na	<0.069	<0.097
Chlordane (technical)	none	0.001	na	na	na	<1.1	<1.6
Polynuclear Aromatic Hydrocarbons (PAHs)							
Phenanthrene	>SOL	4.6	na	<0.11	na	0.18	0.18
Halogenated Volatile Organic Compounds (VOCs)							
Trichloroethene (TCE)	690	360	1.5	na	na	<0.5	<0.5
Tetrachloroethene (PCE)	200	120	0.87	na	na	<0.5	<0.5
Chloromethane	none	41	1.0	na	na	<1.0	<1.0
¹ RBSLs = City of Oakland Urban Land Redevelopment Program Tier 1 Risk Based Screening Levels - residential inhalation of indoor vapors (January 2001) ² ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels - potential discharge into marine or estuary surface water system (February 2005) ³ RCRA = Resource Conservation and Recovery Act ⁴ <(#) = Analyte concentration is below stated reporting limit ⁵ na = not analyzed ⁶ TPH = Total Petroleum Hydrocarbons ⁷ >SOL = RBSL exceeds solubility of chemical in water ⁸ DDT = 4,4'-dichlorodiphenyltrichloroethane ⁹ DDE = 4,4'-dichlorodiphenyldichloroethane ¹⁰ DDD = 4,4' dichlorodiphenyldichloroethylene RCRA Metals analysis by EPA Method 6010B, mercury analysis by EPA Method 7470A TPH-diesel, TPH-motor oil, and TPH-gasoline analysis by EPA Method 8015B Modified Benzene, Toluene, Ethyl benzene, total Xylenes, and VOCs analyses by EPA Method 8021B; only detected VOCs listed Organochlorine Pesticides analysis by EPA Method 8081A; only Organochlorine Pesticides detected in soil samples are listed PAHs analysis by EPA Method 8260B; only detected PAHs listed							



5.0 SUMMARY, CONCLUSIONS and RECOMMENDATIONS

5.1 Summary and Conclusions

Analytical results indicate surface and subsurface soil at the 10800 Edes Avenue site has been impacted by historic use, particularly in areas of former debris piles. Former nursery and greenhouse operations appear to have had minimal impact on the site. The crushed brick fill, originating from building material recycling activities by Evans Brothers Construction, covers the majority of the site. Surface samples collected from the crushed brick fill contain no detectable asbestos. Most sampling locations from the crushed brick fill contain low concentrations of metals, however several locations contained lead at concentrations above residential PRGs. Based on the soil and groundwater data, no contamination from the former boiler room and suspected fuel tank was documented.

Debris piles reported to have been distributed along the site perimeters were removed prior to this investigation. The contents of the former debris piles are unknown. Crushed brick fill was typically not encountered in the majority of borings drilled in debris areas. TPH as diesel and TPH as motor oil contamination was detected in surface soil samples from all 19 locations collected from former debris areas. Surface samples from four of the 19 locations exceed RWQCB ESLs for TPH.

PAHs were detected in surface samples collected from 15 of the 19 borings located in former debris areas. Surface samples from 14 of the 19 surface samples exceed RBSLs. PAHs were detected in subsurface samples from 11 of the 27 boring locations. Subsurface soil samples collected from six of the 27 boring locations exceed RBSLs. The most prevalent PAH exceeding action levels at the site was benzo[a]pyrene. Samples collected from 19 boring locations exceed RBSLs for benzo[a]pyrene and 18 sample locations exceed residential PRGs for benzo[a]pyrene. Based on surface and subsurface soil samples, PAH contamination decreases at depth and generally is not detected below 3 feet bgs.

Lead was detected at concentrations above residential PRGs in soil samples collected from two borings located in former debris areas. One soil sample collected from a former debris area contained arsenic at concentrations significantly higher than background concentrations published by the Oakland ULR Program.

Groundwater samples collected from beneath the site indicate that no significant contamination has occurred. Three halogenated VOCs were detected at concentrations below RBSLs and RWQCB ESLs in a groundwater sample collected downgradient of the former plating shop; halogenated VOCs were not detected in the groundwater samples collected further downgradient. One PAH, phenanthrene, was detected at concentrations below the RWQCB ESL in the groundwater sample collected from the downgradient portion of the site. One RCRA metal, barium, was detected at concentrations below the RWQCB ESL in groundwater samples collected downgradient of the

plating shop and from the downgradient portion of the site. TPH, BTEX, and pesticides were not detected in any of the groundwater samples.

5.2 Recommendations

Analytical data indicates that surface soil and subsurface soil at the site has been impacted by TPH and PAHs in former debris areas. Samples collected from the debris areas were typically collected from soil that appears to be the original grade and not the crushed brick fill. There is a possibility that the source of TPH and PAHs contamination did not originate from the former debris piles and the contamination occurred prior to the placement of the crushed brick fill. Soil samples collected from beneath the crushed brick fill were not analyzed for PAHs. Further investigation of the soil beneath the crushed brick fill in the central portion of the site would confirm whether the TPH and PAH contamination is ubiquitous and was subsequently covered by the crushed brick fill or if the former debris piles were the source of soil contamination.

Based on data collected during this investigation, soil contaminated with PAHs may pose a potential health risk to future occupants at the site. Future actions that could be implemented at the site may include a risk assessment to develop clean up goals for any remedial actions and, if warranted, the development and implementation of a remedial action workplan. Should further characterization be conducted on the soil beneath the crushed brick fill, then those findings should be included in the risk assessment.

Appropriate cleanup goals for the property may either be the RBSLs as mandated by the City of Oakland ULR Program or the cleanup goals established by the DTSC for the removal action conducted at the adjacent EBHH property located at 10900 Edes Avenue. The DTSC clean up goals are 62 µg/kg for benzo[a]pyrene equivalents and 269 mg/kg for lead; the action levels are based on 95 percent upper confidence level (UCL) of mean concentrations. The remedial action workplan for the 10900 Edes Avenue property cited background concentrations of arsenic ranging from 1.1 to 25 mg/kg referenced from March 1998 *Caltrans' Final Feasibility Study Remedial Action Plan, South Prescott Neighborhood Park, Cypress Replacement Project located in Oakland, California*. Remediation of localized areas of elevated TPH, lead, and arsenic contamination should be addressed in the remedial action workplan.

Appendix A

References

References Cited

Brighton Environmental Consulting, *Phase I - Environmental Site Assessment - 10800 Edes Avenue Oakland, California*, September 2005

PES Environmental, Inc., *Removal Action Implementation Report - 10900 Edes Avenue Oakland, California*, August 2005.

Weston Solutions, Inc., *Targeted Brownfields Assessment Phase II Investigation Sampling and Analysis Plan - East Bay Habitat for Humanity, Inc. 10800 Edes Avenue Site - Oakland, California*, Rev 1 - November 2005

U.S. Environmental Protection Agency Region 9 Preliminary Remediation Goals Table, October 2004, <http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf>

U.S. Environmental Protection Agency: *National emission standards for hazardous air pollutants; asbestos* NESHAP revision. Federal Register 1990 November 20;55:48415.

California Regional Water Quality Control Board - Francisco Bay Region, *Screening For Environmental Concerns At Sites With Contaminated Soil and Groundwater Volume 1: Summary Tier 1 Lookup Tables*, INTERIM FINAL - February 2005

City of Oakland Public Works Agency, *Oakland Urban Land Redevelopment Program: Guidance Document*, January 2000

Appendix B

Photographic Documentation

Photodocumentation
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California



Photo 1 - Northwest portion of property



Photo 2 - Northeast portion of property



Photo 3 - Southeast portion of property



Photo 4 - Southwest portion of property

Photodocumentation
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California



Photo 5 - Collecting subsurface soil samples with a Geoprobe from the former boiler room area and debris areas



Photo 6 - Collecting subsurface soil samples with Geoprobe from former greenhouse and debris areas

Photodocumentation
East Bay Habitat for Humanity - 10800 Edes Avenue Brownfields
Oakland, California



Photo 7 - WESTON geologist field screening soil samples for organic vapors with a photionization detector/flame ionization detector.



Photo 8 - WESTON field technician collecting groundwater samples from temporary well screen using a peristaltic pump

Appendix C

Laboratory Analytical Reports